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Jumping plant lice (Hemiptera: Psylloidea) of the Ojców National Park (Southern Poland)

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Abstract: The paper lists psyllids (Hemiptera: Psylloidea) found in and around the Ojców National Park and discusses some selected species. Of the 46 confirmed species, representing the families Aphalaridae, Liviidae, Psyllidae and Triozidae, 44 are reported for the first time from the Ojców National Park. The largest group of psyllids is constituted by taxons related to forests and meadow and herbaceous communities. The following species are of particular interest. *Craspedoplepta flavipennis* (Foerster, 1848), a species characteristic of montane and subalpine altitudes, has its northern limit in Poland. The boreal-upland *Cacopsylla nigrita* (Zetterstedt, 1828) and *Craspedoplepta malachitica* (Dahlbom, 1851) are considered to be typical steppe species in Poland.

Key words: Hemiptera, Psylloidea, jumping plant lice, faunistics, Ojców National Park

INTRODUCTION

The Ojców National Park (ONP) is located in the southern part of the Kraków-Częstochowa Upland in southern Poland about 20 kilometers to the north west of the city of Cracow (Kondracki 2002, Richling 2006). The Ojców Park is the smallest of national parks in Poland, it covers the area of 2146 ha extending over two deep-cut karst valleys (Prądnik Valley and Sąspowska Valley) and small parts of the Jurassic plateau (Wiśniowski 2003). The karst processes of the limestone substrate make the morphology of the area highly diversified (Aleksandrowicz & Aleksandrowicz 2004). The rich relief entails, in turn, the diversification of the meso- and microclimatic conditions, which results in the richness of habitats. Over 950 species of vascular plants have been found in the Park, composing approximately 40 communities (Medwecka-Kornaś 1977, 2006, Medwecka-Kornaś & Loster 1995, Matuszkiewicz J. M. 2001, Matuszkiewicz W. 2001). Over 70% of the area is covered by woodland, mostly mixed oak-hornbeam forests and beech woods. A smaller portion is covered by mixed coniferous forests, maple forests, elm riparian forests, meadows and xerothermic grasslands; the latter two habitats are the richest in plant species.

During the long history of faunistic studies in the area of the Ojców National Park, which were initialized in the 19th century, the ordo Hemiptera has been well investigated – 766 species were collected in this area, which constitutes 33% of Polish fauna of Hemiptera (Bokłak & Klasa2016). Data referring to Hemiptera in ONP are included in over 60 publications (Bokłak & Klasa2016) but detailed faunistic investigation of Hemiptera have been conducted only in few papers: Coccoidea (Koteja & Żak-Ogaza 1969), Aphidoidea (Osiadacz 2006, Osiadacz & Wojciechowski 2009), Fulgoromorpha et Cicadomorpha (Szwedo 1992), Aleyrodoidea (Klasa & Wiśniowski 2016) and Heteroptera (Bednarek 1975, Chłond & Gorczyca 2009).

Among all Hemiptera, psyllids have been the only group that has not been studied in the Ojców National Park in detail yet (Pawłowski 2008, Bokłak & Klasa 2016). Only two species

of psyllids were mentioned from that area previously (Moesz 1920, Skrzypczyńska & Ziemniewicz 2012). Our contribution aims at providing the first list of psyllids of the Ojców National Park.

Psyllids (Psylloidea) constitute a superfamily of sap sucking phytophages within the Hemiptera. Currently, the world fauna of psyllids amounts to about 4000 described species (Percy et al. 2018). In Poland, 113 species have been reported (Drohojowska 2004, Drohojowska & Głowacka 2011).

MATERIAL AND METHODS

The psyllids from the area of the Ojców National Park (ONP) and the nearest vicinity in its buffer zone were collected in the years 1990–2017. Only qualitative samples were collected using an insect net, by shaking and inspecting the host plants. Over 800 specimens were collected from over 30 locations in the area of the Park and the nearest vicinity in the Park's buffer zone [UTM: DA16]: Kolonia Kamieniec, Wielmoża over the Dolina Zachwytu, Murownia hamlet in Biały Kościół (segetal communities) and Małesowa Skała in Wola Kalinowska (Fig. 1). Due to the mobility of psyllids and the small distance between the sites in the buffer zone and the area of the Park, all species were considered as the fauna of the ONP.

The material was preserved in 70% ethanol or dry or slides mounted. For slide mounting, the specimens were cleared in a solution of KOH, passed through chloralphenol and chloral hydrate and mounted in Berlese fluid (Klimaszewski 1969). The material is deposited in the collection of the Silesian University in Katowice.

All collected specimens were identified to species by Jowita Drohojowska, except from three which were identificated by Daniel Burckhardt. The family classification follows Burckhardt & Ouvrard (2012) and Burckhardt & Queiroz (2013), the species nomenclature is according to Ouvrard (2018).

The list of species is organised alphabetically using the classification by Burckhardt & Ouvrard (2012) with additions by Burckhardt & Queiroz (2013). The locations of occurrence of psyllids were ordered based on the dates of the material collection.

Abbreviations used:

Am – ryegrass meadow Arrhenatheretum elatioris, *OB*– xerothermic grassland Origano-Brachypodietum, *rud* – ruderal communities, *seg* – segetal community, *herb* – herbaceous vegetation; AK – Anna Klasa, JD – Jowita Drohojowska, SOP – Straż Ochrony Przyrody (Nature Conservation Guard), [ ] – numbers in square brackets relate to location of Psylloidea occurrence sites at the area of ONP and its buffer zone.

RESULTS

The collected specimens of psyllids belong to 46 species and represent four families: Aphalaridae, Liviidae, Psyllidae and Triozidae.

Familia: Aphalaridae Löw, 1879

Subfamilia: Aphalarinae

***Aphalara exilis* (Weber & Mohr, 1804)**

Material: 1♀; [24], 19 Apr 2011, *herb*, leg. AK.

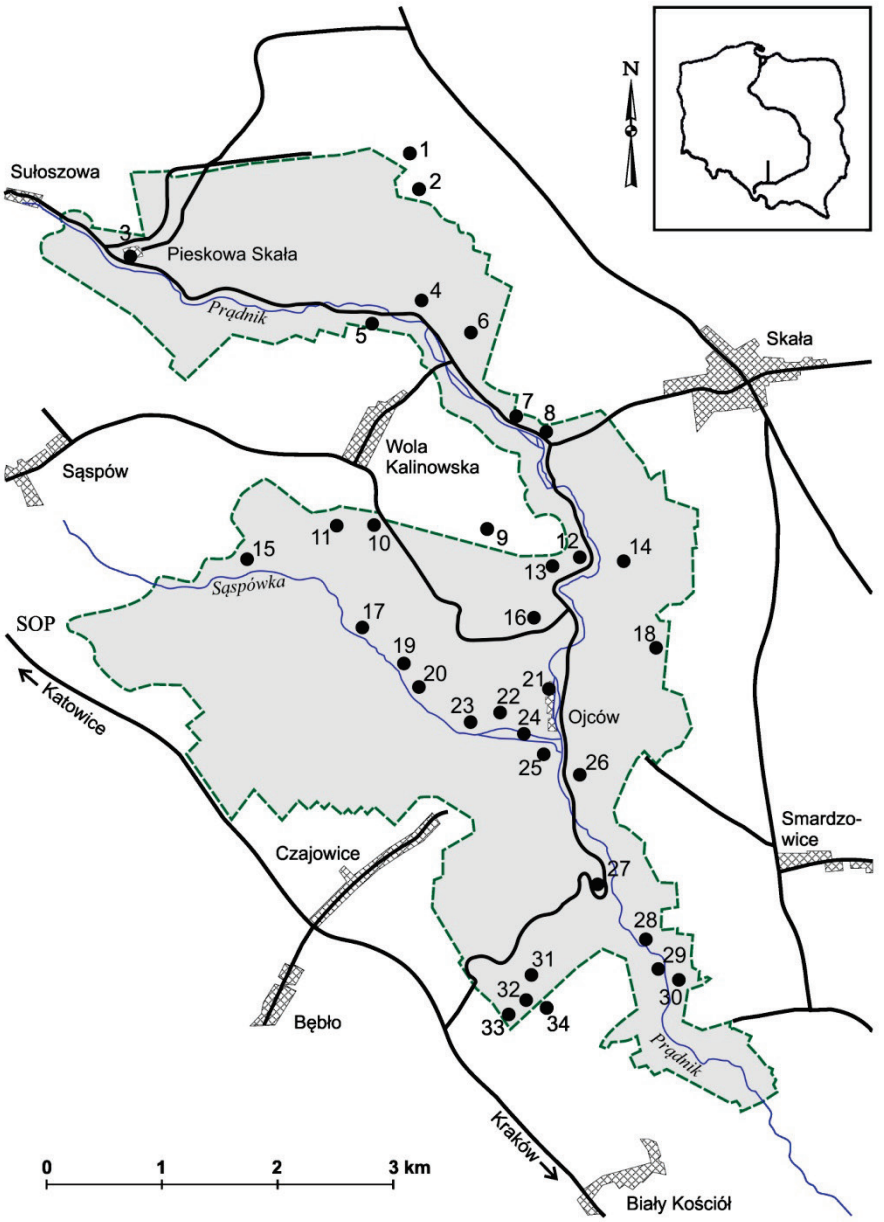

Fig.1. Location of the Psylloidea occurrence sites at the area of the Ojców National Park and its buffer zone [UTM: DA16]: 1 – Kolonia Kamieniec, 2 – Wielmoża, 3 – Pieskowa Skała, 4 – Dolina Zachwytu, 5 – Młynnik, 6 – Wąwóz Pilny Dół, 7 – Grodzisko-Skała Długa, 8 – Grodzisko, 9 – Małesowa Skała, 10 – Ojców-Kolencin, 11 – Wola Kalinowska, 12 – Ojców-Opalówki, 13 – Górkowa Skała , 14 – Dolina Paduch,15 – Sąspów Zabugaje, 16 – near Directorate of ONP, 17 – Dolina Sąspowska (alder forest), 18 – Bukówki, 19 – Dolina Sąspowska (blackhtorn), 20 – Dolina Sąspowska-Skała Szalej, 21 – Ojców-centre, 22 – Wąwóz Błotny Dół, 23 – Dolina Sąspowska- middle part, 24 – Dolina Sąspowska at the exit, 25 – Jonaszówka, 26 – Ojców-Igła Deotymy, 27 – Ojców-serpentines, 28 – Ojców-near guardhouse of SOP (NCG), [DA15]: 29 – Prądnik Korzkiewski, 30 – Skała Krzyżowa w Prądniku Korzkiewskim, 31 – Wąwóz Korytania, 32 – Murownia (Biały Kościół) *Am*, 33 – Ojców-settlement „Iwiny", 34 – Murownia (Biały Kościół) *seg.*

***Aphalara polygoni* sensu Burckhardt & Lauterer, 1997**

Material: 18 ♂♂, 10 ♀♀; [28], 30 Apr 1998, *Am,* leg. AK; [33], 18 Mar 2012, on *Picea abies*, leg. A. Palaczyk; [23]: 30 Apr 2012, *herb*, leg. AK; 6 Jul 2012, *herb*, leg. JD; [21], 17 May 2012, *herb*, leg. AK; [4], 6 Jul 2012, *Am*, leg. JD; [34]: 13 Aug 2013 and 22 Jul 2014, *seg*, leg. AK; [31], 8 Oct 2017, on misletoe *Viscum album* from *Abies alba*, leg. AK.

***Craspedolepta artemisiae* (Foerster, 1848)**

Material: 2 ♂♂, 2 ♀♀; [32], 8 Jun 2014, *Am*, leg. AK.

***Craspedolepta flavipennis* (Foerster, 1848)**

Material: 20 ♂♂, 20 ♀♀; [5], 8 Jun 1990, *herb*, leg. AK; [32], 15 Jun 2006, *Am*, leg. AK; [15], 13 Jun 2013, *Am,* on *Leontodon*, leg. AK; [2], 2 Jun 2015, on *Leontodon*, leg. AK.

***Craspedolepta latior* Wagner, 1944**

Material: 2 ♂♂, 3 ♀♀; [32], 8 Jun 2014, *Am*, leg. AK.

***Craspedolepta malachitica* (Dahlbom, 1851)**

Material: 1 ♂; [7], 30 May 2012, *OB*, leg. AK.

***Craspedolepta nebulosa* (Zetterstedt, 1828)**

Material: 25 ♂♂, 9 ♀♀; [1]: 4 Jun 1999 and 4 Aug 1999, on *Epilobium* sp.; 17 May 2000, *rud*, on *Epilobium* sp., leg. AK.

***Craspedolepta nervosa* (Foerster, 1848)**

Material: 22 ♂♂, 14 ♀♀; [21], 7 Jun 1999, *rud*, leg. AK; [13], 28 May 2012, *OB*, leg. AK; [23], 6 Jul 2012, *herb*, leg. JD; [4], 6 Jul 2012, on *Achillea millefolium*, leg. JD.

***Craspedolepta omissa* Wagner, 1944**

Material: 22 ♂♂, 40 ♀♀; [5], 8 Jun 1990, *herb*, leg. AK; [14], 28 Jun 1990, leg. AK; [1]: 4 Jun 1999 and 30 Jun 1999, on *Artemisia vulgaris*, leg. AK; [23], 31 May 2012, *Am*, leg. AK; [34], 22 Jul 2013, *rud*, leg. AK.

***Craspedolepta subpunctata* (Foerster, 1848)**

Material: 1 ♀; [1], 17 May 2000, *rud*, on *Epilobium angustifolium*, leg. AK.

Subfamilia: Rhinocolinae

***Rhinocola aceris* (Linnaeus, 1758)**

Material: 6 ♂♂, 3 ♀♀; [21], 29 May 2012, on *Acer pseudoplatanus*, leg. AK; [10], 6 Jul 2012, on *Acer platanoiodes*, leg. AK, JD.

Familia: Liviidae Löw, 1879

Subfamilia: Euphyllurinae

***Psyllopsis discrepans* (Flor, 1861)**

Material: 1 ♀; [31], 29 Sep 2011, leg. AK.

Psyllopsis fraxini (Linnaeus, 1758)

Material: 5 ♂♂, 6 ♀♀; [6], 17 Jun 1998, leg. AK; [3], 29 Jun 1998, *OB*, leg. AK; [24], 22 Aug 2013, on Fraxinus exelsior, leg. AK; [23], 1 Jul 2015, leg. AK.

This species was previously recorded from ONP (Skrzypczyńska & Ziemniewicz 2012).

Familia: Psyllidae Latreille, 1807

Subfamilia: Psyllinae

***Arytaina genistae* (Latreille, 1804)**

Material: 10 ♂♂, 22 ♀♀; [34], 28 Sep 2011, leg. AK; [34], 10 May 2012, on *Cytisus* sp., leg. AK.

***Cacopsylla ambigua* (Foerster, 1848)**

Material: 4 ♂♂; [11], 29 Jul 1998, on *Salix* sp., leg. AK; [1], 4 Jun 1999, on *Salix* sp., leg. AK; [4], 6 Jul 2012, on *Salix* sp., leg. AK.

***Cacopsylla crataegi* (Schrank, 1801)**

Material: 1 ♂, 2 ♀♀; [31], 10 May 2012, leg. AK; [7], 30 May 2012, leg. AK.

***Cacopsylla hippophaes* (Foerster, 1848)**

Material: 2 ♂♂, 1♀; [16], 6 Jul 2012, on *Hippophae rhamnoides*, leg. JD.

***Cacopsylla mali* (Schmidberger, 1836)**

Material: 27 ♂♂, 34 ♀♀; [33], 28 Jul 1998, on *Malus* sp., leg. AK; [12], 7 Aug 1999, on *Carpinus betulus*, leg. AK; [21]: 29 May 2012, on *Malus,* leg. AK; 5 Aug 2013 and 7 Aug 2013, on *Malus,* leg. AK; [7], 30 May 2012, leg. AK; [4], 6 Jul 2012, leg. JD; [18], 23 Jul 2012, leg. AK; [23], 9 Aug 2012, on *Malus*, leg. AK; [25], 9 Aug 2012, on *Padus avium*, leg. AK.

***Cacopsylla melanoneura* (Foerster, 1848)**

Material: 13 ♂♂, 35 ♀♀; [33], 18 Mar 2012, on *Picea* sp., leg. A. Palaczyk; [21], 27 Mar 2012, on *Picea abies*, leg. AK; [34], 5 May 2012, on *Crataegus* sp., leg. AK; [31], 10 May 2012, leg. AK; [8], 8 May 2013, on *Crataegus* sp., leg. AK; [5], 8 May 2013, on *Crataegus* sp., leg. AK.

***Cacopsylla moscovita* (Andrianova, 1948)**

Material: 2 ♂♂; [11], 29 Jul 1998, on *Salix* sp., leg. AK; [10], 6 Jul 2012, on *Salix* sp., leg. JD.

***Cacopsylla nigrita* (Zetterstedt, 1828)**

Material: 1 ♂, 1 ♀; [21], 27 Apr 2012, on *Salix* sp., leg. AK; [24], 30 Apr 2012, *herb*, leg. AK.

***Cacopsylla peregrina* (Foerster, 1848)**

Material: 67 ♂♂, 49 ♀♀; [30], 4 Oct 2011, 14 Jun 2013, on *Crataegus* sp., leg. AK; [8], 6 Jul 2012, on *Crataegus* sp., leg. JD; [18], 23 Jul 2012, on *Crataegus* sp., leg. AK; [34], 19 Aug 2012, on *Crataegus* sp., leg. AK; [9], 6 Aug 2013, on *Crataegus* sp., leg. AK.

***Cacopsylla pruni* (Scopoli, 1763)**

Material: 5 ♂♂, 6 ♀♀; [23], 26 Apr 2012, on *Prunus spinosa*; [27], 27 Apr 2012, on *Prunus spinosa*, leg. AK; [33], 5. May 2012, leg. AK.

***Cacopsylla pulchra* (Zetterstedt, 1840)**

Material: 13 ♂♂, 15 ♀♀; [34]: 28 Jul 1998 and 14 Aug 2012, on *Salix* sp., leg. AK; [11], 29 Jul 1998, on *Salix* sp., leg. AK.

***Cacopsylla pyri* (Linnaeus, 1758)**

Material: 2 ♂♂, 6 ♀♀; [8], 30 May 2012, on *Pyrus* sp., leg. AK; [34], 13 Aug 2013, *seg*, leg. AK.

***Cacopsylla pyricola* (Foerster, 1848)**

Material: 3 ♂♂, 4 ♀♀; [23], 30 Apr 2012, on *Pyrus* sp., leg. AK; [33], 5 May 2012, leg. AK; [12], 9 May 2012, on *Pyrus* sp., leg. AK; [26], 17 May 2012, on *Pyrus* sp., leg. AK; [8], 30 May 2012, on *Pyrus* sp., leg. AK.

***Cacopsylla pyrisuga* (Foerster, 1848)**

Material: 3 ♂♂, 3 ♀♀; [24], 27 Oct 2011, on *Picea* sp.; [23], 30 Apr 2012, on *Pyrus* sp.; [33], 5 May 2012; [26], 17 May 2012, on *Pyrus* sp., leg. AK.

***Cacopsylla saliceti* (Foerster, 1848)**

Material: 1 ♂, 4 ♀♀; [23], 1 Apr 2003, on *Salix* sp., leg. AK, [3], 19 Apr 2004, on *Salix* sp., leg. AK.

***Cacopsylla ulmi* (Foerster, 1848)**

Material: 26 ♂♂, 29 ♀♀; [23], 3 Nov 2011, on *Ulmus* sp., leg. AK; [10], 6 Jul 2012, on *Acer* sp., leg. JD; [16], 9 Aug 8.2012, on *Ulmus* sp., leg. AK.

***Cacopsylla visci* (Curtis, 1835)**

Material: 1 nymph; [31], 8 Oct 2017, on misletoe *Viscum album* from *Abies alba*, leg. AK, det. D. Burckhardt.

***Chamaepsylla hartigii* (Flor, 1861)**

Material: 4 ♂♂, 5 ♀♀; [30], 4 Jun 2012, on *Betula* sp. , leg. AK; [34], 19 Aug 2012, on *Betula* sp. leg. AK.

***Psylla alni* (Linnaeus, 1758)**

Material: 23 ♂♂, 21 ♀♀; [29]: 4 Oct 2011, 14 Jun 2012, on *Alnus glutinosa,* leg. AK; Dolina Sąspowska, 31 May 2012, on *Alnus glutinosa* and *Am*, leg. AK.

Familia: Triozidae Löw, 1879

***Bactericera albiventris* (Foerster, 1848)**

Material: 1 ♂♂, 3 ♀♀; [24], 27 Oct 2011, on *Picea* sp., leg. AK; [31], 5 May 2012, on *Salix* sp., leg. AK; [21], 17 May 2012, leg. AK; [5], 8 May 2013, on *Salix* sp., leg. AK.

***Bactericera nigricornis* (Foerster, 1848)**

Material: 1 ♀; [1], 17 May 2000, *rud*, on *Epilobium angustifolium*, leg. AK.

***Dyspersa apicalis* (Foerster, 1848)**

Material: 1 ♀; [13], 9 May 2012, *OB*, leg. AK.

***Trichochermes walkeri* (Foerster, 1848)**

Material: 19 ♂♂; [23]: 5 Aug 2013, 14 Aug 2013, on *Rhamnus catharthica*, leg. AK.

***Trioza abdominalis* Flor, 1861**

Material: 1 ♂♂, 1 ♀; [32]: 23 Sep 2012, *Am*, larva on *Tanacetum vulgare*, 1♀ emerged the larva 26 Sep 2012, leg. AK; 22 Jul 2014, *Am* on *T. vulgare*, leg. AK, det. D. Burckhardt.

Tanacetum vulgare has not been provided as a host plant for any kind of psyllid to that moment.

***Trioza agrophila* Löw, 1888**

Material: 1 ♂, 3 ♀♀; [23], 31 May 2012, *herb*, leg. AK.

***Trioza centranthi* (Vallot, 1829)**

Material: 5 ♂♂, 3 ♀♀; [23]: 20 Apr 2012, leg. AK and 26 Apr 2012, *herb*, leg. AK.

***Trioza cirsii* Löw, 1881**

Material: 3 ♂♂, 4 ♀♀; [14], 28 Jun 1990, leg. AK; [23]: 5 Aug 2013 and 22 Aug 2013, *Am*, leg. AK; [32], 19 May 2014, *Am*, leg. AK, det. D. Burckhardt.

Trioza dispar* Löw, *1878

Material: 1 ♀; [21], 9 May 2012, *herb*, leg. AK.

***Trioza flavipennis* Foerster, 1848**

Material: 1 ♂; [21], 27 Mar 2012, on *Picea excelsa*, leg. AK.

This species was reported almost a hundred years ago from the area of the present ONP (Moesz 1920).

***Trioza galii* Foerster, 1848**

Material: 1 ♂, 5 ♀♀; [24], 27 Oct 2011, on *Picea* sp., leg. AK; [7], 30 May 2012, *OB*, leg. AK.

***Trioza remota* Foerster, 1848**

Material: 1 ♂, 7 ♀♀; [31], 5 May 2012, on *Quercus* sp., leg. AK.

***Trioza rhamni* (Schrank, 1801)**

Material: 1 ♂, 7 ♀♀; [23], 14 Aug 2013, on *Rhamnus catharthica*, leg. AK

***Trioza urticae* (Linnaeus, 1758)**

Material: 35 ♂♂, 32 ♀♀; [1], 30 Jun 1999, *rud*, leg. AK; [33], 18 Mar 2012, on *Picea* sp., leg. A. Palaczyk; [21]: 27 Mar 2012, on *Picea abies*; 27 Apr 2012, leg. AK; 9 May 2012 and 17 May 2012, *herb*, leg. AK; [7], 30 May 2012, *OB*, leg. AK; [23]: 6 Jul 2012, *herb*,

leg. JD; 9 Aug 2012, *Am*, leg. AK; [10], 6 Jul 2012, leg. JD; [4], 6 Jul 2012, leg. JD, AK; [22], 9 Mar 2015, on *Chrysosplenium* sp., leg. AK.

DISCUSSION

The investigation of psyllids fauna in the area of the Ojców National Park resulted in identifying the presence of 46 species of psyllids, out of which 44 had never been recorded before in the ONP. Two species: *Psyllopsis fraxini* and *Trioza flavipennis* had been recorded earlier by Moesz (1920) and Skrzypczyńska & Ziemniewicz (2012) and presence of these species could be confirmed. The 46 listed species of psyllids constituting nearly 40% of the national fauna and representing all the four families that are present in Poland have been found in the area of the Ojców National Park and its buffer zone.

The number of species recorded in the Ojców National Park appears relatively high in comparison with other areas in Poland where the fauna of Psylloidea has been the subject of detailed faunistic surveys: in the Bieszczady National Park, 30 species were found (Klimaszewski 1971, Drohojowska & Klimaszewski 2000), in the Gorce National Park – 39 (Głowacka & Migula 1996), in the Babia Góra National Park – 17 (Głowacka 1979). The most were found in the Tatra National Park – 58 (Smreczyński 1957, Drohojowska & Głowacka 2011). Given the small ONP area, the species richness seems particularly high.

The diversity of the flora and plant communities of the Park determines the diversity of the Psylloidea fauna. The Psylloidea listed here are tied to several types of environments: forest communities, meadows of different type and herbaceous communities, xerothermic grasslands and scrubs, felling sites and ruderal communities. They also occur on ornamental plants and fruit trees. It should be noted that adult wintering psyllids related to herbacaeous plants change their environment in the fall and fly to coniferous trees (e.g. *Trioza flavipennis*, *T. urticae* were noted on spruce and *Aphalara polygoni* were found on evergreen misletoe *Viscum album*).

The largest amount of psyllid species were collected in forest habitats. These 13 species include: *Rhinocola aceris* feeding on the Acer genus, *Psylla alni* related to the *Alnus* genus, *Trioza remota* – to *Quercus* oaks, *Chameapsylla hartigii* – to *Betula* sp. birch, *Cacopsylla ulmi* – to *Ulmus* spp., two species of psyllids residing on a *Fraxinus excelsior* ash*: Psyllopsis discrepans* and *P. fraxini* and several species residing on the *Salix* willow: *Cacopsylla ambigua, C. moscovita, C. nigrita, C. pulchra, C. saliceti*, *Bactericera albiventris*. The largest numbers of "forest" psyllids are found in riparian communities, which – in the ONP – are ones of the most degraded communities and form specific patches in two locations: the Prądnik valley and the Sąspowska valley.

Another group (12 species) consists of the psyllids residing on the plants of meadows and herbaceous communities. These are populating both humid meadows and herbaceous communities in the Prądnik and Sąspowska valleys, but are more common in mesophilic meadows located at the plateau or at the slopes of valleys that are floristically richer (Murownia, Zabugaje, Wielmoża). Seven species of the *Trioza* genus are included in that group: *Trioza*: *T. agrophila, T. centranthi, T. dispar, T. flavipennis, T. urticae* and *T. cirsii*, three species of the *Craspedolepta* genus*: C. artemisiae. C. flavipennis, C. latior.* and two of the *Aphalara* genus: *A. exilis* and *A. polygoni.* In the group of species related to meadows, the most interesting seems to be the *Craspedolepta flavipennis*, a polyphage residing on the plants from the *Chrysanthemum*, *Leontodon*, *Crepis* and *Hypochoeris* genus. The psyllid is common in the Carpathian mountains (Głowacka 1979, Malenovsky & Lauterer 2011), Gorce mountains (Głowacka & Migula 1996), Tatras (Drohojowska & Głowacka 2011), Sudetes (Głowacka 1989) and is rare in lowlands – noted in isolated communities in the Upper Silesia, the Greater Poland – Kuyavia lowland, the Pomeranian Lakeland and the

Baltic sea littoral (Klimaszewski 1975). General distribution is Central Europe (Lauterer & Burckhardt 2004) but the northern boundary of occurrence thereof is in Poland.

Another group is constituted by thermophilic species residing at the xerothermic grasslands and in thermophillic scrubs. The following reside in the thermophilic schrubs: two species of psyllids related to *Rhamnus*: *T. rhamni* and *Trichochermes walkeri*, three species of the *Cacopsylla* genus related to *Crataegus*: *C. crataegi*, *C. melanura* and *C. peregrina*, *Cacapsylla pruni.* – on blackhtorn and *Arytaina genistae* residing on insolated loess slopes covered with *Cytisus scoparius*. Xerothermic grasslands, on the other hand, are inhabited by the polyphage of the Apiaceae – *Dyspersa apicalis*, *Craspedoplepta malachitica* residing on *Artemisia absithium,* which is considered typical to steppe (Klimaszewski 1975) and *C. nervosa* developing on the *Achillea* and *Trioza galii* provided with *Galium* sp. and *Ononis* sp. The four latter species of psyllids were collected in grasslands located at southern insolated slopes in Grodzisko and Górkowa Skała, which are the sanctuary of xerothermic species of plants and invertebrates of various groups.

A poorly isolated group is constituted by psyllids found in ruderal and felling sites and sometimes meadow communities: polyphage – *Bactericera nigricornis*, related to the *Artemisia vulgaris – Craspedolepta omissa* and the species residing on *Epilobium angustifolium: Craspedolepta subpunctata* and *C. nebulosa*. *C. subpunctata* and two other species of psyllids: *Trioza dispar,* and *Cacopsylla nigrita* were known in Poland only from the Tatras (Drohojowska & Głowacka 2011) and Sudetes (Głowacka 1989) and the latter species is considered to exhibit a boreal-upland distribution in Europe (Klimaszewski 1975) and submontane and montain regions in the Czech Republic (Malenovsky & Lauterer 2011). No boreal species have been found in the ONP. Further analyses of the psyllids' distribution may be found to be insufficiently reliable due to the selective knowledge of the psyllids residing in Poland and the Palearctic realm. A similar conclusion had been reached by Klimaszewski (1975) over 40 years ago – unfortunately this remains to be true.

The list of Psylloidea of the ONP ends with the species residing in orchards – on the pear tree: *Cacopsylla pyri, C. pyricola* and *C. pyrisuga*, the apple tree – *C. mali* and the ornamental shrub – *Hippophae rhamnoides* sea buckthorn – *C. hippophaes.* Until recently, the last of the mentioned psyllids was considered rare and only related to the Baltic sea litoral (Smreczyński 1954, Klimaszewski 1963). It was later noted on the Tarnowskie Góry Hummock (Kanturski & Drohojowska 2013) and as of recent, it was multiple times collected by the authors in the entire country from the planted sea buckthorn. It was thus spread around the country along with its host plant. Two psyllids found in the Park: *Cacopsylla crataegi* and *C. flavipennis* are included in the Polish red list of endangered species, in the LC lower risk category (Drohojowska et al. 2002).

The investigation of psyllidofauna in the ONP shall provide an insight into biodiversity of an area under special environmental protection, i.e. a national park. It is particularly important in connection with the special character of the ONP, due to constant presence and activity of man within its area (Partyka 1990). Providing better insight into the relationship of psyllids and their host plants and other organisms that are related to them is of vital importance both to environmental protection and to the protection of biological diversity.

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STRESZCZENIE

[Koliszki (Hemiptera: Psylloidea) Ojcowskiego Parku Narodowego (południowa Polska)]

W pracy przedstawiono listę koliszków (Hemiptera: Psylloidea) stwierdzonych na terenie Ojcowskiego Parku Narodowego i jego otulinie. Odnotowano występowanie 46 gatunków koliszków z czterech rodzin: Aphalaridae, Liviidae, Psyllidae i Triozidae. Spośród wykazanych gatunków zaledwie dwa były wykazane wcześniej z tego obszaru a 44 to nowe stwierdzenia dla fauny Ojcowskiego Parku Narodowego. Najliczniejszą grupę koliszków stanowią taksony związane z lasami oraz zbiorowiskami łąk i ziołorośli. Zanotowano tu: *Craspedoplepta flavipennis* (Foerster, 1848) charakterystyczny dla terenów górskich i osiągający w Polsce północną granicę zasięgu występowania, borealno-górski *Cacopsylla nigrita* (Zetterstedt, 1828) oraz *Craspedoplepta malachitica* (Dahlbom, 1851) uważany za gatunek typowo stepowy występujący na terenie Polski.

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